

NØ0164-75-C-0279

KOLLSMAN TYPE NO. A45782 10 00%

SERIAL NO. 103

105

106

NOVEMBER 1976

KOLLSMAN INSTRUMENT COMPANY

MERRIMACK, NH 03054

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- 1. Contract N00164-75-C-0279 called for the delivery of six altimeters similar to the type AAU-32/A except they were to contain a resolver output of indicated altitude and a potentiometer output of barometric setting. The six units were built and tested as required and delivered to NWSC Crane for their evaluation.
- 2. NWSC testing indicated three units had problems; #103 had scale error -350°C out of tolerance conditions at nine test points,

#105 had a reversed phasing arrangement on the resolver, and #106 had a seizure of the baro setting knob.

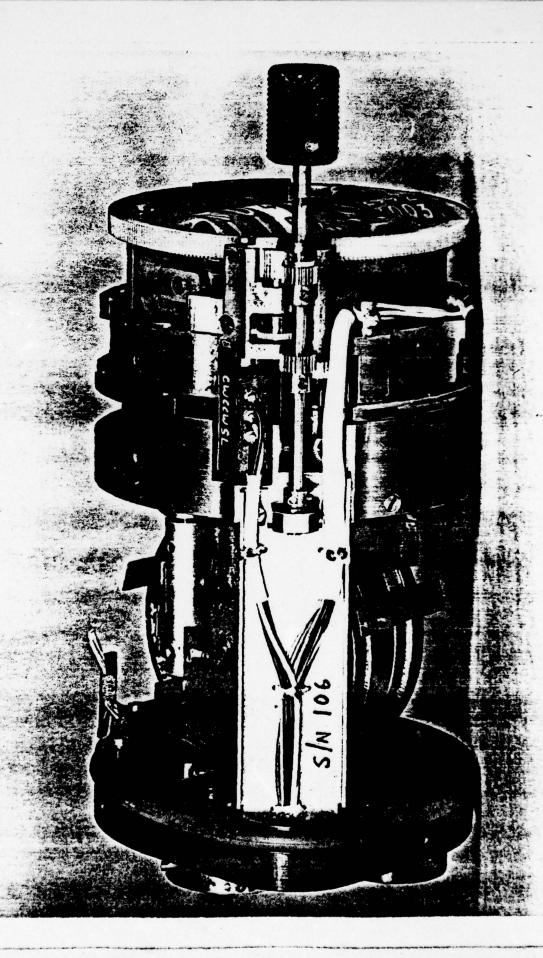
- At receipt at Kollsman, the three units were retested for the functions designated.
- 4. Unit #103 required recompensation; i.e., the thermostatic bimetals were reset and the calibration checked. The unit has been completely retested and data is attached to this report.

Unit #105 - The reversed phasing was confirmed. The resolver excitation leads were reversed, and the unit retested. The resolver had the lead colors reversed and a conventional VTVM had been used. The testing has now been modified to require a phase-sensitive VTVM for that testing, so that this problem should not recur.

Unit #106 was opened and checked. The bearing for the lower end of the knob shaft had not been lubricated and had thus seized the knob shaft as reported. This portion of the altimeter was disassembled, reworked and completely retested. The test data is attached to this report.

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- The units have been returned to NWSC for their evaluation and acceptance.
- The sump on the case was extended to the rear face of the instrument to allow for assembly of the mechanism into the case with all parts completely installed. This design liberty was taken because the added length above the amount specified in Mil-A-81851 (AS) made the unit identical to the AAU-32/A specified in Mil-A-81852(AS). The installation provisions of the AAU-32/A had undergone a fleetwide installation survey and the specification was amended to permit the extended sump. This installation procedure permits a complete checkout of the mechanism prior to installation in the case. With both a resolver and a baro potentiometer, it is particularly important to have the relationship of the electrical elements correlated to the display elements prior to installation in the case. It is also worth noting that the static port was also positioned as for the AAU-32/A because the 4.750 length of case showed some problems of static connections upon installation in the aircraft. The outline drawing of the unit is included to clarify both of the above points.



Subject	SM	19.		Dat	e ///	3			
Type No.				Job	No.				
Remarks	9 459821				10013	22			
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Subject	5/1/	103		Date	///	1/26		
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270°	245	-5-						
DIAL FACE UP	245	-5-						
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Subject	S/N	103		Date	11/8/2		
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Remarks	BARO	7.0016			70072		
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Subject	S/N	103				ate	11/5/	16
Type No.	A 457821				J	ob	No.	
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29.0	-430	-450	- 835	-8	-855			
29.5	+25	+30		28	-395		.392	
29.72	+ 425	+430	0	0		15	0	
30.5	+ 950	+ 950		-6	70.3	-6	531	
20.9	+ 1320	+1320		12	+ 895	-	893	
3/.0	+1415	+ 1415	+990	77	+990	47	983	
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.6	73,384	43.381 33.445	4,129		+115		43.27	
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30.0	30.993	21.743	4.014		+.013		30.90	
.3	12.557	12.568	-043		032	-	21.27	
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Subject	S/N	103		Date	11/8/	1		
Type No.	1 1/578210001 100127							
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2.5	2500	2545	45-	70'				
3.5	3500	3550	50	70'				
12.5	12500	12565	65	70'				
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Subject	5/N 1	2 7		Date W/=
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5	0	0	251	
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	110	100	350				
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AD-0160

Kollsman Instrument Co

Subject	SN	107		D	ate ///	1/11
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Remarks		de Seal				
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2	21.094	,	415			-
3 5 8	28.125		+20			
5	42.187		+20			
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12	77.344	-15/0	-25			
15	112.500	-35/-20				
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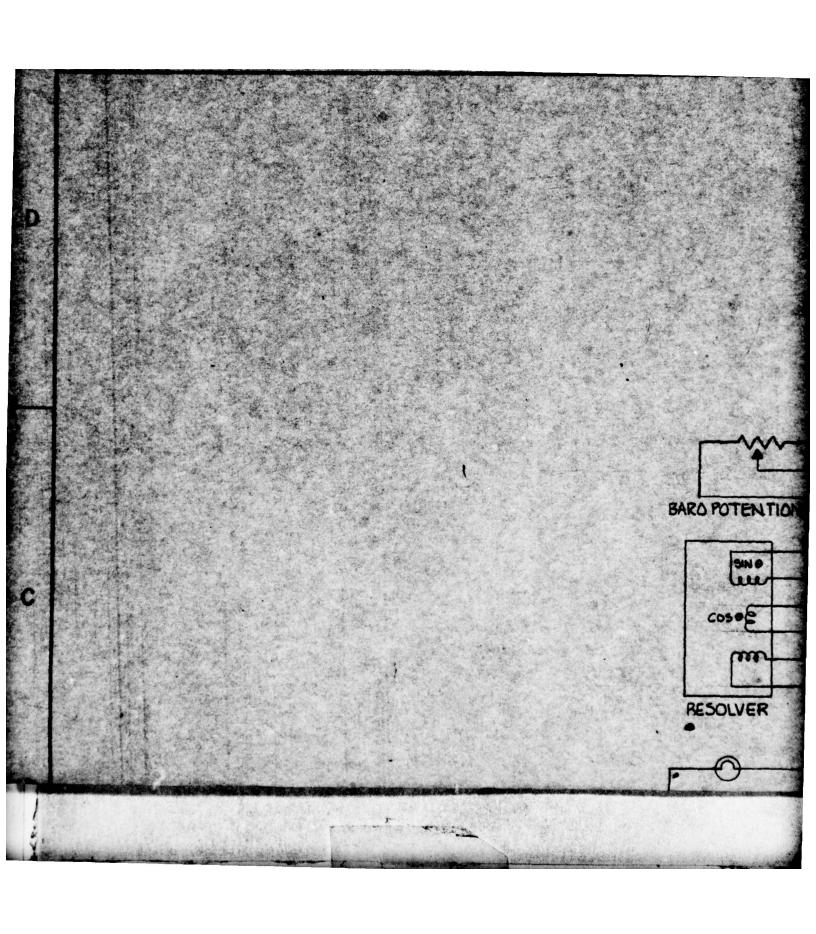
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Type No.	A4578	2 10 0	1		Job No.	/
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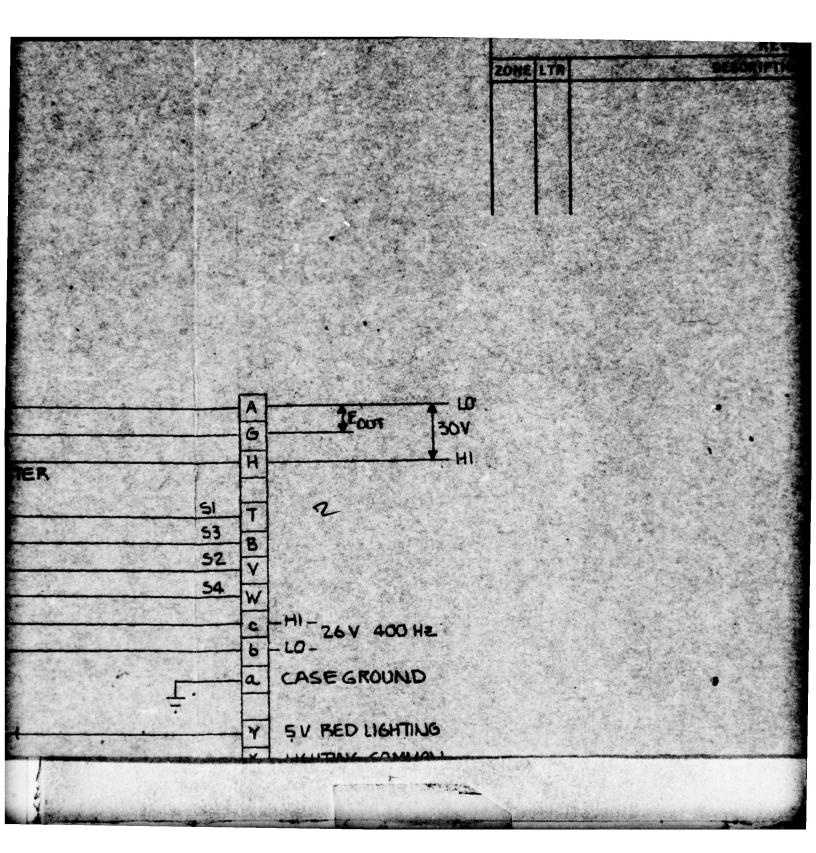
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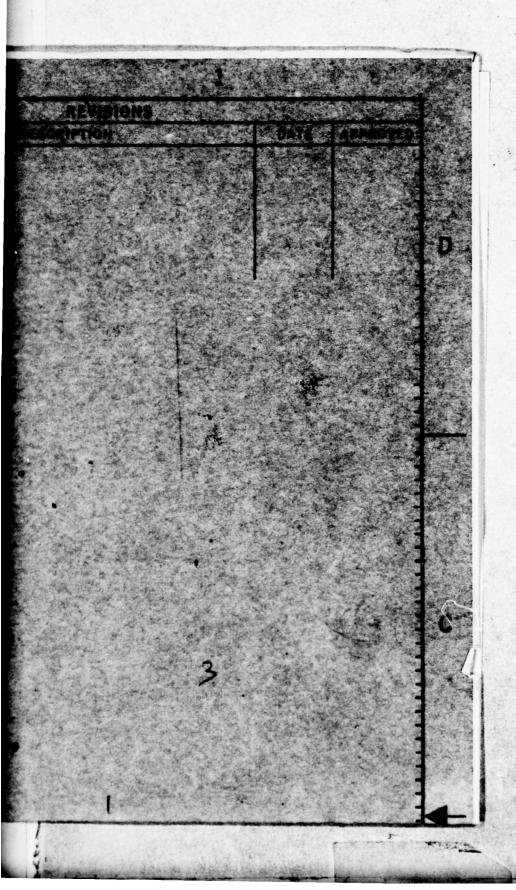
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15	112.500	-3-1-25	- 50			
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20	147.656	-45/-30	-45			
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Type No. A 4576.2 10 001 Date 11/20/2										
Remarks Altitude Seal-Erver										
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12	17.544									
15	112.500	-20 1-10								
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20	147 656	-40 1-30 -45-1-35					,			
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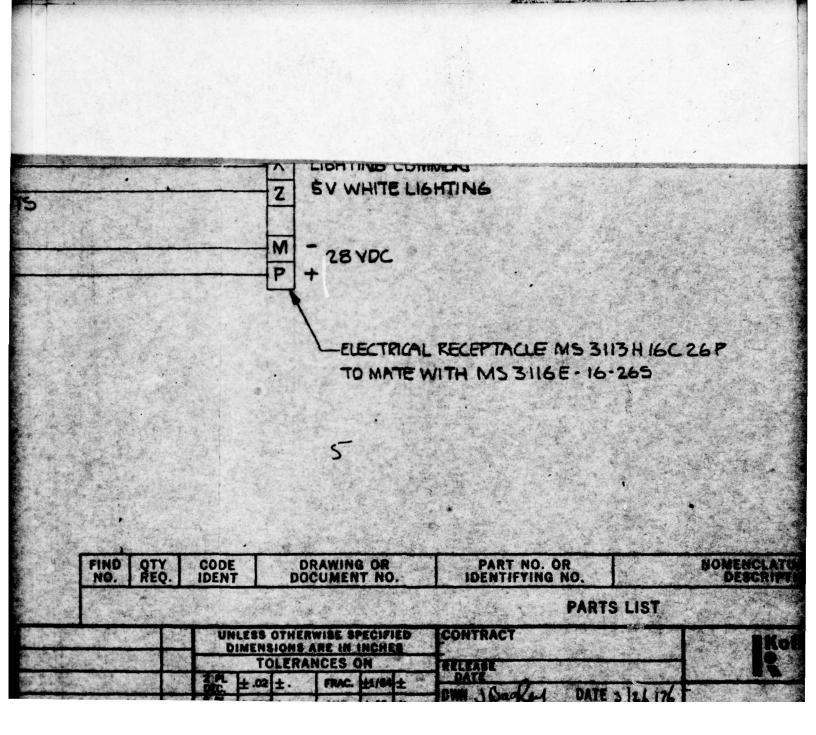
Subject	5 N	105			Date //	16/26
Type No.	A4578		501		Job No.	1 / -
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3 5	21.094	0/+5	0			
3	28.125	0/+5	0			
5	42.187	+20/ +35	+5-			
8		+15/ +25				
10	77.344	0/110	+15-			
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15	112.500	-10/0	+30		•	-
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20	147.656	-1st o	+20		•	
25	182.813	-40/-20	+5-			
30	217.969	-357-25	0			
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50	358.594	-160/-145	-5-			
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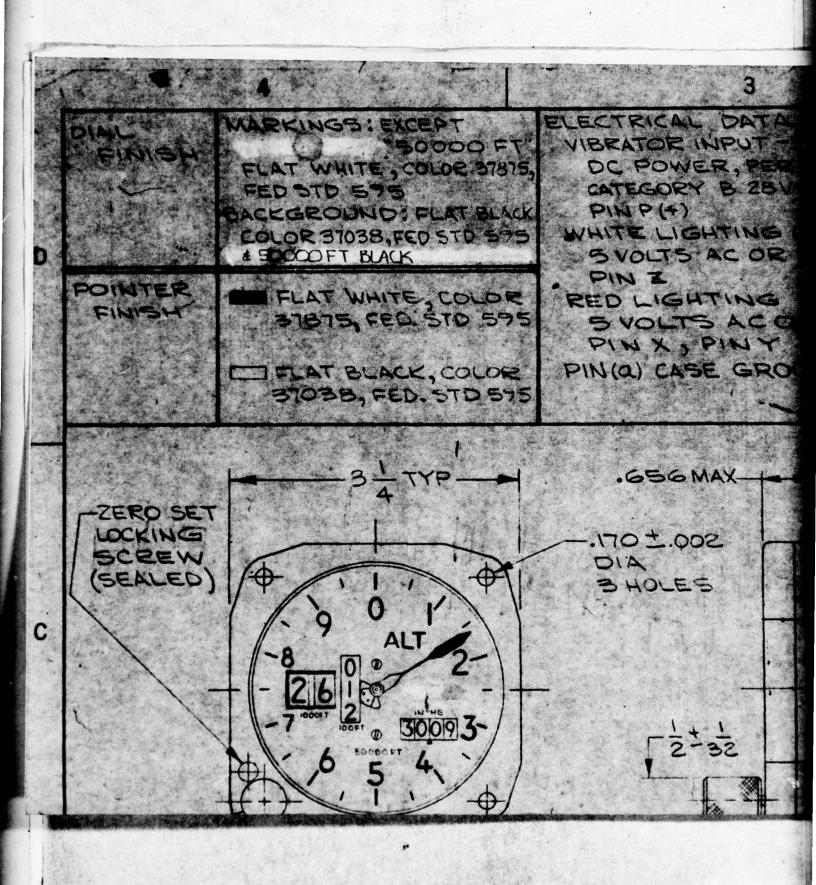


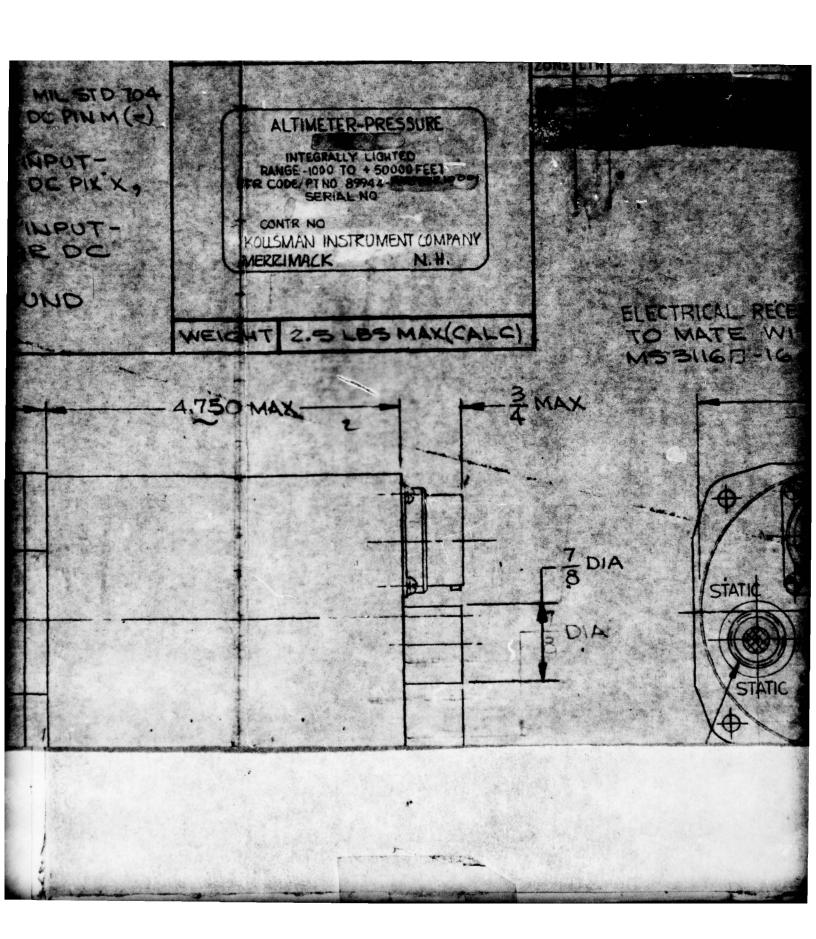
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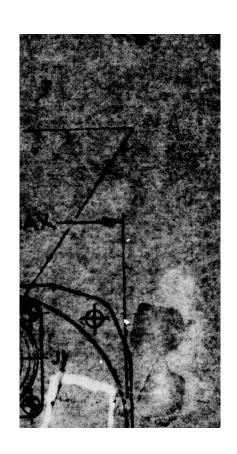


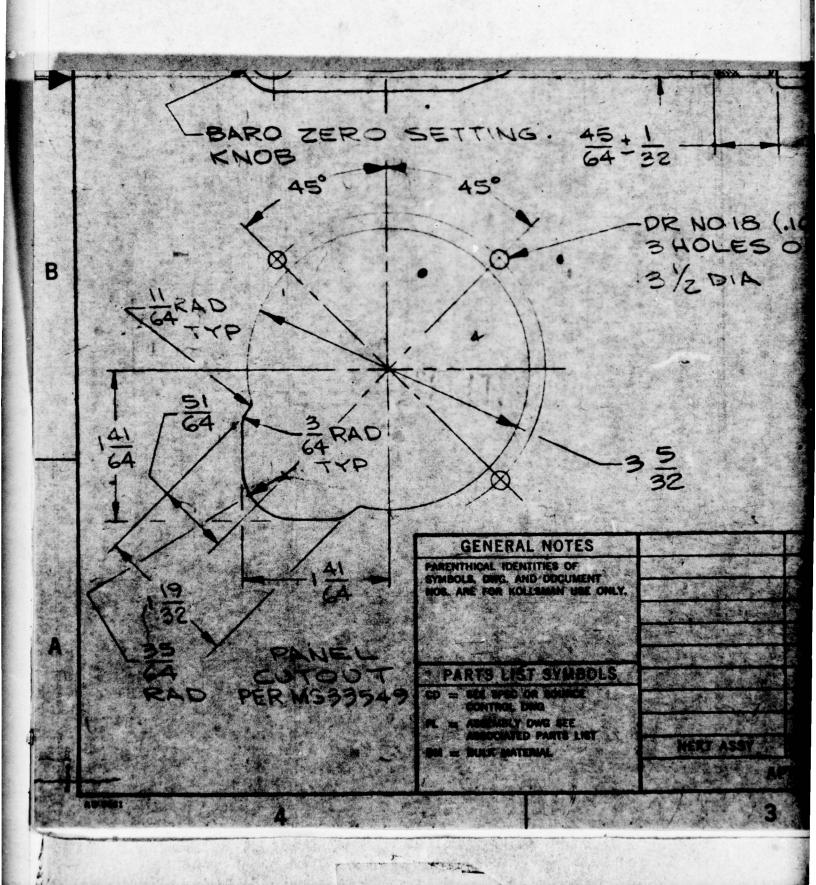
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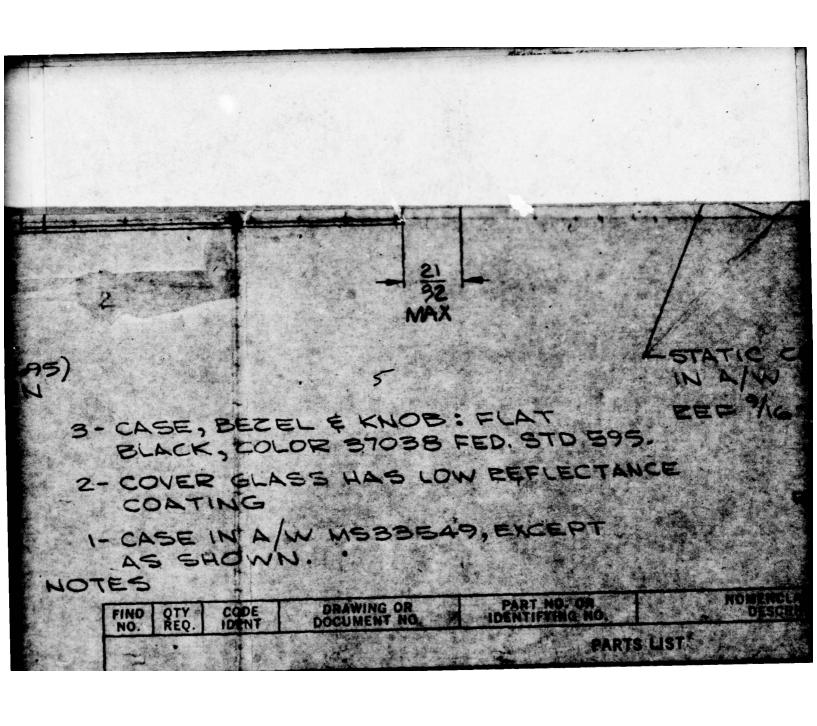
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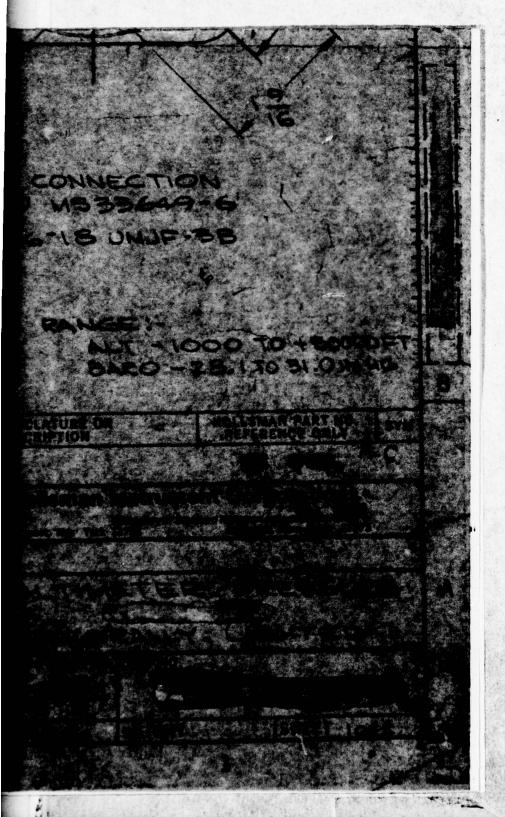












Subject	SM	105		Date	///2	2				
Type No.	9 457821	· Job	Job No. /00/27							
Remarks			- 6 0.30	\	70076					
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Subject	5/1/		Date 1/2					
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Subject	S/M 105				Date ///2 Job No.				
Type No.	A-157821.0001					Job Na. 100127			
Remarks	5 -				<u> </u>	70072	2		
Remarks BARO TOROUF									
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28.1	-1/238	-1685	-1750	+3	-1775	-2	-1.727	1 25	
28.5	-1200	- 1295	-1330	-11	7500	-10	-1,340	•	
29.0		- 19.	- 560		- 110		-863		
29.5	- 310	- 7/1-			-375		-392		
29.92	1 4/0	4110			.*	Ó	0		
30.5	-45-73	4575	+500	1	+ 535	4	531		
30.9	-1 575	40	- 575	12	15%	-3	893		
3/.0	-1020	J 1393	+ 950		-980	2	983		
							V/R		
28.1	90.921	90.915	+ , 124		7.038		90.90	± .83	
4	81.203	81.220	+ . (53		.100		81.18		
. 7	71.54%	71.500	094		- 084		21.63		
29.0	62.081		-,019		-,011		62.10		
.3	52.477	52 1.43	-,5/2		-1.013		52.63		
.6	42 227	13.364	1 157		4.094		43.27		
29.93	73.759	27.4/22	4 160		4,095		22,33		
30,0	30.045	30.995	4.045		4.095		30.90		
.3	21.508	21.785			+,055		21.23		
.6	12.1.27	10,149			4.048		13.60		
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31.0	1.1.13	2.613	4.043		4.043	Ŀ	0.57	•	
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AD-0160

Kollsman Instrument Co

Subject	SM 10	5	Date	Date 11/12/75						
Type No.	A 15782		· Job	Job No. 100127						
Remarks STATIC FRICTION										
	0/14/10		<u></u>							
		•								
Signature //										
Signature 6. Clining										
ALT	VIB. off.	VIB ON	DIFF	Tol.		•				
	500	,-,,-	. 45	54'						
1.5	1500	575	45	70°						
2.5	2500	2575	45	70'						
3.5	3500	3545	15	70						
12.5	12.500	125-65	65	90'						
22.5	22500	22575	75	130'						
32.5	32500	32595-	95	180'						
		•								
			~		-					

					·					

Subject	5/11	105		Date	11/	1.
Type No.	/			. Job	No.	00
Remarks	A 4576				1001	<u> </u>
	STOP + -					
	VICEATO.	R ON				
				Sign	ature b.	7
ALT	INC	Dec	TOL			/ .*
0	0	0	. 25'			
	0	0	5:5°			•
3	0	.^	25'			
5	0	0	25° 25°			
10	- (35'			
20	0		25'			
30	0	0	25'			
35	0	0	50'			
40	0	0	50'			
50	0	0	• •			
					\(\frac{1}{2}\)	
						•

Remarks	S/N D 45783 STOP 4 T (1890TOP	TUMP		: Job	No. 10018						
Remarks	STOP & T	TUMP			_/00/a						
/	1.BRATOR	067=									
		* 0									
		Signature									
Signature (SK)											
						11:					
ALT	TNC	DEC.	701			V .					
0 .	60	2.	300								
/	2/5	5	120								
3		10	130								
5	267	35	130	4							
10	70	50	550								
20	50	7^	350			·					
30	150	1.7	350								
35	125	110	600								
40	175	125	. 600								
50	255	9 10									
						•					
		. 91									
	ļ				. "						
	 										

Subject	5/N	105			Date	11/12	
Type No.	,			`.	Job N	0. 11/12	
Kamaric	1145982					10013	2
	STOP +	Jump	VIERAT	000) N		
	450 DIA	1 DOWN	INC				
	450 DIA	L UP	200				
						•	^ "
•.					Signat	ure of	6: 22 J
					19		/
ALT	45 DUAL DOUN	45° DIAL UP	TOL				
	1						
0	0	0	75'				
7	0		75'				•
5	6		75'				
	0		75'				
10	0	6	75'		-		
20	-		25				
30	<u></u>	j ,	160'				
35	0		100'		-		
70							
		· · · · · · · · · · · · · · · · · · ·					

						*	
	*						

Subject	S/M	Date	Date ///2					
I WINA NA	/			Job	No.			
Remarks	9 457821 Case Li	000/			10012	2		
	CASE LI	EAN ROO	100 30	0,5001				
		•						
Signature								
	•			.		/		
` '	LEGK							
0	20'							
90°	10'							
180°	1					•		
220°								
	a 7K	55'						
				<u> </u>				
				•				
			·					
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			· :			· · · · · · · · · · · · · · · · · · ·		

Subject	SN	105			Date	1/8/	26
Type No.		2. 10 0			JOD NO.	100/2	
Remarks		de Sout					
						- 1	**
		Temp.	erature -	35 6	Signature	Chie	-15
Test	Resolver	Altimeter				· K	1
Altitude	Bridge	Seale Errer	Error			4	
Altitude 1000 5+	Setting	feet:	feet				-
-1	.0.0	+35/+40	-10				
0	7.031	+35/240	- /A				
+0.5		135 1200					
11	14.063	+30 1+30	-10				
2	21.094	+35/-0	-16				
3	28.125	+35/+30	-10				•
5 8	42.187	160 / +65	-3-				
8		155/ +20					
10	77.344	+10/+45	410				
12		+40 1-105					
15	112.500	125-1+30	+20				•
18		410/115					
20	147.656	115/ 420	روب				
25	182.813	-10/-6	0				
30	217.969	-15-1-5	-3				
35		+35/140					
40	288 281	+60, +70	75				
45		-257-15					
50	358.594	-1957-140	-10		, "		
	*						
		Un / Down					
	Creelpri	. 0					
	•						

Subject	SN	1005			Date	11/15	61
Type No.		2 10			Job No		
Remarks		de Seal					
	111/1/19						
	783		7.77				
•		Temp.	erature t	45 %	Signatu	ré o	
Test	Resolver	Altimeta			4		7
	Bridge	Scale	Error		7		/ · ·
Altitude 1000 5+	Setting	feet"	feet			. 10.	
-1	0.0	-5/+5	5				
0	7.031	-5/45	-5-A-				.8
+0.5		-5/+5		7 7 7 7			
11	14.063		-5-		4		- S
2	21.094		一, 一,	5.0			127
3 5 8	28.125		- 57	1/1		100	4
5	42.187	120 / 13	0	1.7			
8		120/105					
10	77.344		-110				
12		+5/120					
15	112.500	-10/ts	+20	•		1.7	•
18		-20/-5					7
20		-10/45	420				
25	182.813	-301-20	<				
30	217.969	-25 1-20	-16				
35		+25-1-130					
40	288 281	165/165	-5				
45		-201-10					
50	358.594	-140/-190	-70		,		
	•					1.	
		Up / Down					
	1000 1000	25'					
	•						
							• •

Subject	5N	105			Date	11/1	2
Type No.	A4578		~	•	Job		
Remarks		de Seul					
		67 - 10	i in				
		Temp.	erature ;	125°C	Sign	ature	Lung
Test	Resolver	Altimeter					// .
Altitude 1000 5+	Bridge Setting	Error	Error	1.			1.
1000 f+		feet"	feet				
-1	.0.0	+10/ +10	-5		-	,	
0	7.031	+10/+10	-5-		1.00	(-t, "0"	1./22 👟
+0.5		+10/+1					
1 1	14.063	15-1+5	-5.				
2	21.094	410/415	-5-				
3		110/7/5	-5-				
<u> </u>	42.187	135/ 1-10	0				
		+30/+40					
10	77.344	+15/+25	+10				
12		115 /125					
15	112.500	15/10	+25			·	•
18	•	-5/0					
20		+5-/+10	ナルー				
25	182.813	-25/-15	0				
30	217.969	-751-20	-5				
35		+30/+35					
4 D	288281	150/160	0				
45		-10/-20					
50	358.594	-1457-145	-5-			-, -	
*************						41 - 4	
		Up / Down					
							•
	Charleri	15					
	•						

•Subject	Spi	106		Dat	e	
Type No.				· Jol	No.	
Remarks	9 457821				10013	27
	Examida	71011	or poo	hoor_		
	LIGHTIM	16 7557	-			
						. 73
- 0				Sig	natures in a	iholas
			•			•
PART	Acc.	REJ.				
DIAL						
CASE	1					•
POINTE 12	/					
STATIC PORT	~					
CONNECTOR						
					•	
				<u> </u>		
	LIGHTING					
RED	-/-					
WHITE						
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					3. °	
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			<u>:</u>		 	
		1				

AD-0160

Kollsman Instrument Co

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Subject	5/1	106	Date ///2					
Type No.	A 45788			Joh	Job No. 100137			
					70075			
	POSITION	- RRO	e					
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·				1-2	\overline{Q}	_		
				Sign	ature	i ver		
						/		
Position	READIME	DEERENCE			0			
NOZIAPL	260	0	•					
90°	2115	5				.•		
180°	253	5						
270°	250	0						
BOLFACE UP	:50	0						
	•							
		:						
					* 0			
					·, •			
					4.			
					/			
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. Subject	S/N	106		Date	////	
Type No.	11:157821			Job	No. 10012	
Remarks	BARO	TARRIE				
	DAKO 1					
		· · · · · · · · · · · · · · · · · · ·				
					•.	/:
•	· · · · · · · · · · · · · · · · · · ·			Sign	ature	
						7
DEECTION	02 IN READING	ToL:				/ *
C.W	3.0	5 ± 2			/	
C. C. W	4.0	5 ± 2 5 ± 2				*
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				•	35	
					Mar.	
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						• • • • • • • • • • • • • • • • • • • •

Subject	S/N	106		D	ate	11/12	
Type No.	A 457871	0001		1,	ob	No. /00/2	·
Remarks	BARO Ser		```	5			
4	THEO CEY	2LF FRE	016 + 5	PARO PO	37		
		<del>-</del>					
						<del></del>	
•				169	AA	1	
				6	gn 00/	ature	Mary
TEST Point	<u>c.w.</u>	C.C.W.	CORRECTED C.W.	CORRECTO C.C. W	9	CORRECT DIFFERENCE	/ Tak
28.1	-11.15	-1650	-1725-2	-1730 -	2	-1,727	± 25
28.5	- 1260	-1260	-1540 1	-1-13		-1,340	
29.0	- 785	-785	- 065 45	- 415°	·	-863	
29.5	- 310	- 7/1	- ":: \ -2		-2	-392	
29,92	4 < 1	453	0 1	0	0	0	
30.5	4611	4610	1530-1	-1570 -	1	531	
20.9	4 975	4 355	4875 12		12	893	
3/.0	27998	1 11 13	795512	4455	12	983	
						V/R	
1.85	10.718	90.914	4.030	4,54	_	90.90	± .83
.4/	81.217	81,215	+,097	t. 195		81.12	
. 7	71.651	71.626	1,051	2.00%		71.63	
29.0	62.168	62,132	4118	4.052		62.10	
.3	52745	53.720	4.115	1.010		52.63	
.6	43.583		+ 113	1 12 !		43.27	
39.92		37,499		1.156		23.32	
30.0	31.606	31.074	4,106	-1.727	·	30.90	
.3	21,509		4.179	1.060		21.73	
.6	12656	12.55Z 3,545	4.036	4.05%		12.60	
9	2.585	1.584	-, * 52	4.04	•	3.57	•
31.0	2.5.83	7.387	4.015	7,074	<u> </u>	0.57	•
					-		
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·		L	L	L		L	

Subject	SIN	106		Date	11/1	,				
Type No.	A 15783	10001		· Job	No.					
Kemarks			,		10013					
	3/////	FRICTIO	<u>~/</u>							
<del></del>				Is:		<u> </u>				
	(SK) Or Creen									
			•	3.5	<del>◎ ,</del> .	1				
ALT	YIB. OFF	VIB ON	DIFF	Tol.		/ -				
.5	• প্ৰত	500		70'						
1.5	1500	1575	22.00	70'		•				
2.5	2500	2 (40	<i>/</i> ·,	70'		·				
3.5	7515	7550	150	70 .						
12.5	12500	12560	60	90'						
2.55	22500	12585	55	130'						
32.5	31500	70110	110	180'						
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					4 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -					
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	1									

Subject	5/N		Date /// 2						
Type No.	/	: ]]	Job No.						
A 4578210001 100127									
STOP & Jump									
VICEATOR ON									
Signature Change									
			• .			VI			
ALT	INC	Dec	TOL						
0	· · · ·	0	<i>25'</i>						
		-	55°			*			
3	0	- (	25.						
3-			25'						
10	0	0	25'						
20	.0	0	25'			· .			
30	0	0	25'						
35	1	0	50'						
40	0	ð	50-						
50	0	0							
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		Andrews							

· Subject	S/N 11	Date ///2		
TAPC TIO.	A 45782	Job No. 100127		
Remarks				700767
	STOP + J			
l	LIBRATOR.	OFF		
				Signature Comp
				- 1/
_ALT	INC	Dec.	70L	
0.	75-	50	300	
	30	25	120	
3	5.5	110	120	
5	60	57	130	<u> </u>
10	95	1.73	350	
05	110	111:	350	
30	150	1 .30	350	
35	150	145	600	
40	210	200	600	
50	-55	52.6		
	′.			
		7		
				<del>  </del>
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Subject	5/1	106			Date		
Type No.	/			:	Job		. 6
Remarks	A 15782					10012	7
	STOP +	Jump	VIERAT	OR C	M		
	450 DIA	1 DOWN	INC			· .	
	450 )19	L UP	Dec				
						1 . 7	· .
•					Sign	ature	Victory .
ALT	WOODYNG SA	45° DIAL UP	TOL				U. * *
0	0.	O	75'				
		?	75'				
3			75'				
5	^	1	75'				
10	1		75'				
20			25'				
30	<i>^</i>		100'				
35	1	^	100'				
40	Ø	- 1					
	ļ						
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Subject	S/M /	Date	Date						
Type No.		Job	Job No. 100127						
# 4578210001 100127  Remarks CHSE LEAK ROOM 30,500'									
Chie Lene Room 20,300									
						7			
Signature (SK)									
					109	1			
•	TEAK					1.			
0	35-1								
900	15-1					-			
180°	10'								
270°	5-1								
		,				·			
	€ 3k	13				1			
	9								
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		8 -				*			
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	-								
						•			
9									

Subject	SN	101			Date	11/0	/2/
Type No. A 45782 10 000					Job No.		
Remarks					L	10012	7
	H/fitu	de Scal	ctror		-		
		•					
						/	
		Temp.	erature	35°C	Signate	Te frene	<b>1</b>
Test	Resolver	Altemeta			1.	1	P
		Scale Error	Error			0	:*
Altitude 1000 St	Setting	feet	feet				
-1	0.0	0/ +23	-5				
0	7.031	0/+20	0				
+0.5		0/425					
11		+5-1+30	0				
2		+15/+19	-13-				
. 3		+15 / +35	710				•
5	42.187	+25 / -1/5	+25				
8	17th 3141	0 / +30					
10	77.344		- 3				
15	112 500	-30/-5	-5				
18	112.000	,	-3				
20	147 656	-65/-25					
25		-1201-10	- 25		-+		
30		-1201-40	-5-				
35	211.303	-60/425					
40	288 231		^				•
45		-1157-10			1 10		
50	358.594		0				
		7					
		Un / Dewin					
							•
	Less Leek	5'					
-						*	

Subject SN 106					Date 11/10/01					
Type No. A 45782 10 001					Job No.					
Demonstra										
Altitude Seal-Erver										
Temperature + 45 C Signature										
Test	Resolver	Altimeta	Resolver				7/-			
Altitude 1000 ft	Resolver Bridge Setting	Error.	Error							
		feet			$= \downarrow$					
	.0.0	-301-20	6		$\dashv$					
0	7.031		0				**			
+0.5		-20/-10								
		-15/-5	0		$\dashv$					
2		-5/+5	- (		$\dashv$					
3 5 8		-5-10	0							
2	42.187	+5-1+10	75							
8	1717 3 W.L	-10/0			$\dashv$					
10	77.344	-30 /-20	-20		$\dashv$					
15	112.500	-20/-10			-+					
	112.500	,	-10	•	-+					
18	1117 /5/	-537-15			-+					
20		-601-50	-15							
25		-801-65	-10							
35	21.1. 363	-90 1-70 -30 1-10	-10		-+					
40	288 281		0		-					
45	200 201		C		$\rightarrow$					
50	758 400	-5 d-35 -205 F-200				**				
- 55	300.391	115/-110	75			*				
		VI / Down								
		J Joenn								
	Case lenk	30								
			6							
						•				

Subject	SN	106	1,3		Date ///	1.2				
Type No.		-	Job No.							
Remarks 01/4-1-01/6										
Remarks Altitude Scale Erver										
		1								
Temperature +25 C Signature Ching										
Test	Resolver	Altimeter				1/				
Altitudo 1000 ft	Bridge Setting	Error.	Error							
1000 ft		teet	feet							
-1	0.0	-5-1-5	.0							
0	7.031	10	0							
+0.5		01,0								
<u> </u>	14.063		.15							
2		4.0/4/5								
3		+10/-120	+5-							
3 5 8	42.187	-15/4.00	115							
8	1711 D.UU	+57+10								
10	177.349	-157-5	-15							
-	112 500	-10/0								
15	112.300	-20 1-10	-5							
18	1117 /5/	-50/-48				-				
20		-50/-40	-20							
25		-761-55	- 5							
36	211.969	- 201-60	-5							
40	288 281	- , ,								
45	LOC LOI	7								
50	762 804	-2401-225			1 7.					
90	300.331	2701-175	75							
		Vi / Down								
		77 7 05:00								
	Case look	30								
	35.07.75									
			.•							